

EVALUATION OF SOUTHERN PINE BEETLE
INFESTATIONS IN SOUTHEAST TEXAS

by

M. M. Ollieu^{1/} G. N. Mason^{1/} and L. E. Drake^{2/}

ABSTRACT

A cooperative aerial photographic survey was conducted by the Forest Pest Control Section of the Texas Forest Service and the Division of Forest Pest Control to evaluate the current status of the southern pine beetle, Dendroctonus frontalis Zimm., population in southeast Texas. A one-percent sample was obtained over 3.6 million acres of outbreak area. Beetle activity appears to be remaining at a relatively constant level when compared to the past three years.

INTRODUCTION

An appraisal survey to determine the status of the overwintering southern pine beetle population in southeast Texas was made by the Forest Pest Control Section of the Texas Forest Service, Lufkin, Texas, and the Division of Forest Pest Control, USFS, Alexandria, Louisiana between January 15 and February 2, 1968. An area of approximately 3.6 million acres was included in this survey. Survey results indicate that overwintering populations of the southern pine beetle are at a relatively low level; 5.1 infested trees per M acres host type.

SURVEY METHODS

An aerial photographic survey was made over the east Texas southern pine beetle outbreak area. Thirteen east-west flight lines were established at five-mile intervals, from Beaumont to the Sam Rayburn Dam (Fig. 1). Photo plots were located at five-mile intervals on each flight line. A total of 194 sample plots were photographed. Stereo-pairs, maintaining 60 percent overlap, were

^{1/} Texas Forest Service, Lufkin, Texas

^{2/} U. S. Forest Service, Div. of Forest Pest Control, Pineville, La.

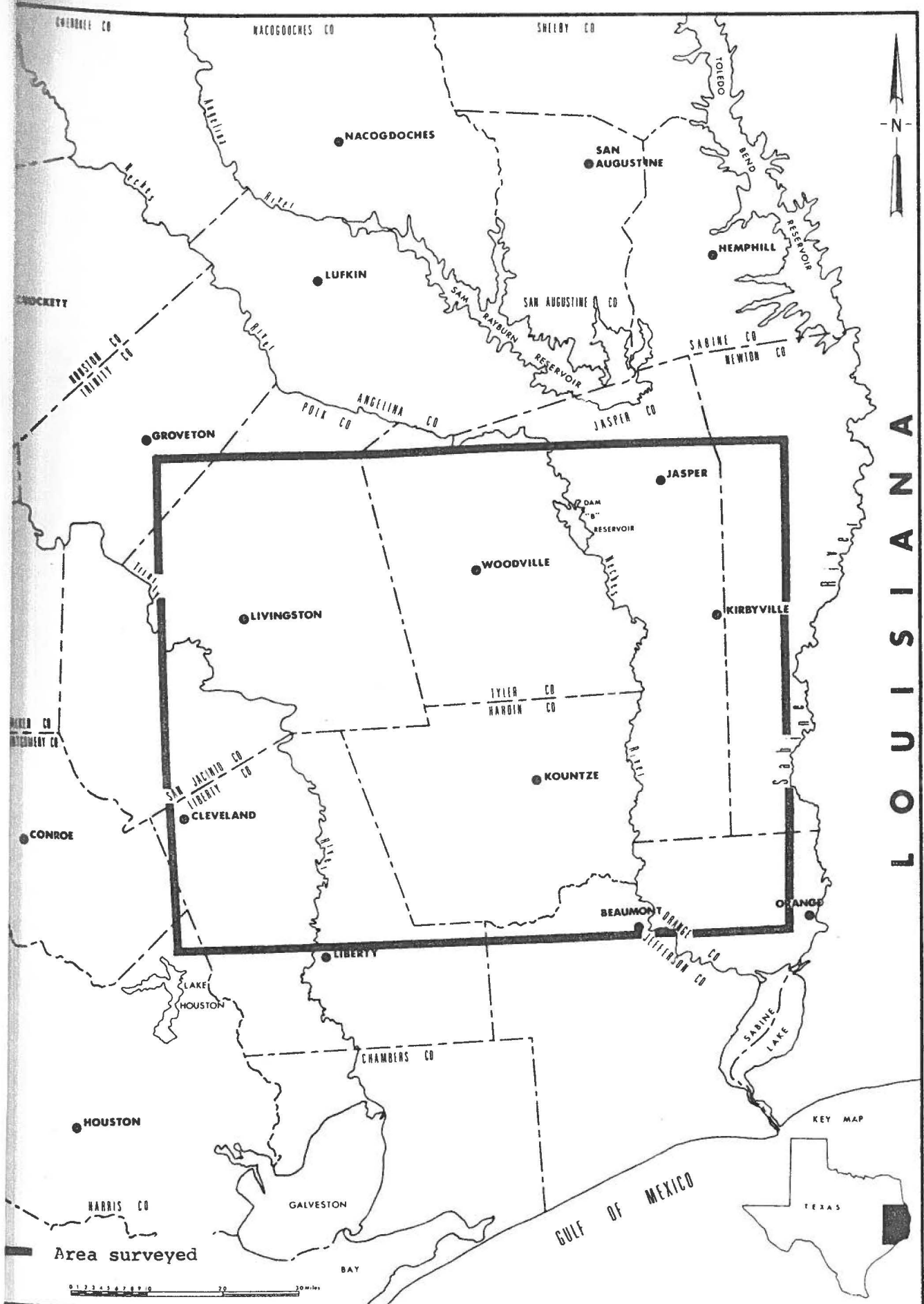


Fig. 1 Area included in southern pine beetle survey of January 1968

taken at each plot. Examination of a 200-acre portion of each plot gave a one percent sample of the 3.6 million acres covered.

Photographs were taken with Kodak Ektachrome infrared Aero film, type 8443. An Aero Commander, Model 500-B aircraft, equipped with a K-17C aerial camera with 12-inch lens and Wratten No. 12 (minus blue) filter was used to produce photos with a ground scale of 1:6000.

Photographs were processed at the Alexandria, Louisiana Office of the U. S. Forest Service, Division of Forest Pest Control. Photo plots were delineated on the photographs, host acreage determined and the plots scanned stereoscopically for the presence of dead and dying pines.

All spots detected on the photo plots were ground checked to determine cause of mortality. The subsequent data were then analyzed according to the procedure developed for operation recorder surveys (Ketcham, 1964).

RESULTS

A total of 188 usable photo plots resulted from the aerial phase of the survey. Photo interpretation revealed thirty-seven spots of which all were later ground checked. Thirty of the spots contained trees with active southern pine beetle infestation; the remaining seven contained pines killed by *Ips* engraver beetles, *Ips* sp., black turpentine beetle, *D. terebrans* (Oliv.) lightning, fire and natural gas.

The survey revealed the presence of 1.0 spots of pine timber dying from various causes and 3.6 trees actively infested by southern pine beetle per M acres (Table 1).

Table 1. Level of southern pine beetle infestation, southeast Texas, January 1968.
(Confidence limits of 90 percent)

Area	Spots	Trees
Per M acres	1.0 ± 0.6	3.6 ± 2.6
Per M acres susceptible host type ^{1/}	1.4 ± 0.9	5.1 ± 4.0

^{1/} Susceptible host type is defined as any stand where 25 percent or more of the stems are pine.

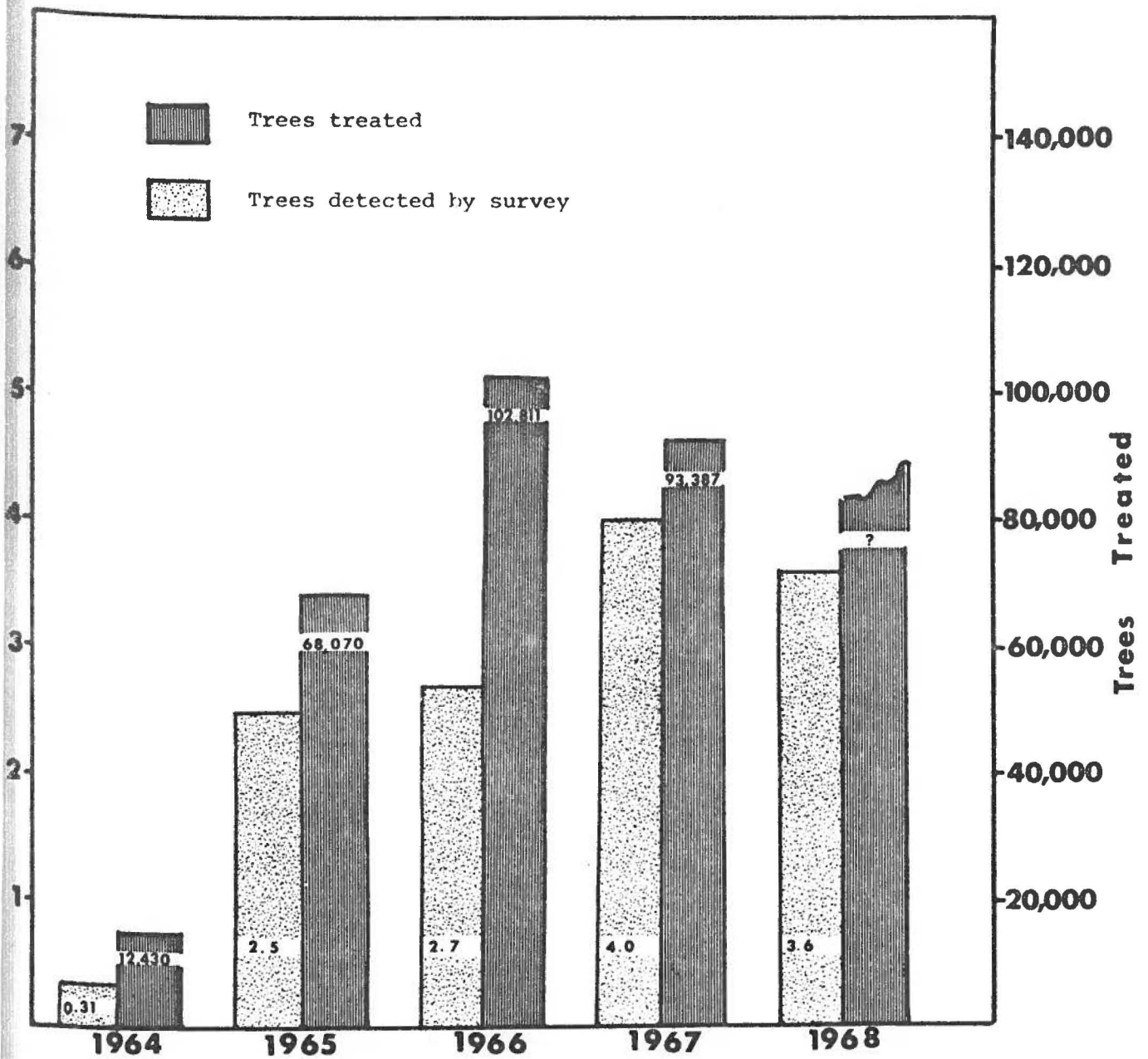


Fig. 2 Southern Pine Beetle Infestation Level and Annual Tree Mortality. Southeastern Texas 1964-68.

Statistics for spots per M acres of pine type and trees infested per M acres of pine type were calculated to obtain information which can be used throughout the range of the southern pine beetle. Susceptible host type, i.e., pine type, contained 25 or more percent pine.

DISCUSSION

The 3.6 trees infested per M acres compares closely to results from the previous three January surveys (Williamson and Ollieu, 1966). These levels and recorded tree losses can be used to help estimate future losses if control continues as in past years (Fig. 2).

RECOMMENDATIONS

1. Efforts should be made to utilize or chemically treat all infested trees detected during the survey to further reduce the population. Control should follow the procedures outlined by the Texas Forest Service.
2. Detection flights should commence over areas where infestations are concentrated.
3. Another evaluation survey using color aerial photography should be made in January 1969.

REFERENCES

- Ketcham, D. E., 1964. Aerial survey plan for sampling pine bark beetle populations. Proceedings of the Third Annual Work Conference, Branch of Forest Insect and Disease Control, Division of S&PF, U. S. Forest Service, Atlanta, Georgia.
- Williamson, D. L. and M. M. Ollieu, 1966. Aerial Survey of Southern Pine Beetle Infestations in Southeast Texas, Texas Forest Service. Unpublished Report.